WHAT IS CLAIMED IS:

1. A electrical machine, comprising:

a housing assembly having first and second ends;

a first bearing mounted in said housing, said first bearing having a plurality of rolling elements disposed between first inner and outer races ;

a second bearing mounted in said housing and spaced away from said first bearing, said second bearing having a plurality of rolling elements disposed between second inner and outer races;

a rotor assembly having first and second ends mounted in said first and second bearings, respectively, such that said rotor has a predetermined amount of axial and radial play relative to said housing; and

a biasing element disposed between one of said rotor assembly or said housing and one of said bearings, said biasing element urging said rotor assembly to a preloaded position which eliminates said axial and radial play, wherein each of said first inner and outer races and said second inner and outer races is secured to one of said rotor assembly or to said housing, such that said rotor assembly is retained in said preloaded position.

2. The electrical machine of claim 1 wherein said first and second outer races are secured to said housing, and said first and second inner races are secured to said shaft.

3. The electrical machine of claim 1 wherein said biasing element comprises a spring disposed between said rotor assembly and said first or second inner race.

4. The electrical machine of claim 1 wherein said biasing element comprises a spring disposed between said housing and said first or second outer race.

5. The electrical machine of claim 1 wherein said housing assembly comprises:

a generally cylindrical housing including an axially extending portion with a front end plate connected to a front end thereof; and

an end bell attached to a rear end of said housing.

6. The electrical machine of claim 1 wherein the coefficients of thermal expansion of said housing assembly, said bearings, and said rotor are selected so that said rotor assembly will be retained in said preloaded position over a temperature range of about -40° C to about 105° C.

7. The electrical machine of claim 6 wherein said bearings are constructed from high carbon chromium steel and said housing assembly and said rotor assembly are constructed from 400 series stainless steel.

8. A method of assembling an electrical machine, comprising:

providing a housing having first and second ends;

disposing a first bearing in said housing, said first bearing having a plurality of rolling elements disposed between first inner and outer races;

disposing a second bearing in said housing, said second bearing having a plurality of rolling elements disposed between second inner and outer races;

providing a rotor assembly having a longitudinally-extending shaft;

rotatably mounting said rotor assembly in said housing with said shaft received in said first and second bearings, such that said rotor is in a first position in which it has a predetermined amount of axial and radial play relative to said housing;

installing a biasing element between one of said rotor assembly or said housing and one of said bearings, such that said biasing element forces said rotor assembly to a second position in which said axial and radial play is eliminated; and

securing each of said first inner and outer races and said second inner and outer races to one of said rotor assembly or to said housing, such that said rotor assembly is retained in said second position.

9. The method of claim 8 wherein said first and second outer races are secured to said housing, and said first and second inner races are secured to said shaft.

10. The method of claim 8 wherein said biasing element comprises a spring disposed between said shaft and said first or second inner race.

11. The method of claim 8 wherein said biasing element comprises a spring disposed between said housing and said first or second outer race.

12. The method of claim 8 wherein each of said first inner and outer races and said second inner and outer races is secured by a method selected from the group consisting of: press fitting, adhesive bonding, welding, or brazing.

13. An electric motor, comprising:

a generally cylindrical housing assembly having first and second ends, said housing defining first and second spaced-apart bearing pockets;

a first bearing having a plurality of rolling elements disposed between first inner and outer races, said first outer race being received in said first bearing pocket;

a second bearing having a plurality of rolling elements disposed between second inner and outer races, said second outer race being received in said second bearing pocket;

a rotor assembly including a shaft received in said first and second inner races, such that said rotor has a predetermined amount of axial and radial play relative to said housing; and

a biasing element disposed between one of said rotor assembly or said housing and one of said bearings which urges said rotor assembly to a preloaded position which eliminates said axial and radial play, wherein said first inner and outer races are secured to said shaft, and said second inner and outer races are secured to said housing, such that said rotor assembly is retained in said preloaded position.

14. The electric motor of claim 13 wherein said first and second outer races are secured to said housing, and said first and second inner races are secured to said shaft.

15. The electric motor of claim 13 wherein said biasing element comprises a spring disposed between said shaft and said first or second inner race.

16. The electric motor of claim 13 wherein said biasing element comprises a spring disposed between said housing and said first or second outer race.

17. The electric motor of claim 13 wherein said housing assembly comprises:

a generally cylindrical housing including an axially extending portion with a front end plate connected to a front end thereof; and

an end bell attached to a rear end of said housing.

18. The electric motor of claim 13 wherein the coefficients of thermal expansion of said housing assembly, said bearings, and said rotor are selected so that said rotor assembly will be retained in said preloaded position over a temperature range of about -40^0 C to about 105^0 C.

19. The electric motor of claim 18 wherein said bearings are constructed from high carbon chromium steel and said housing assembly and said rotor assembly are constructed from 400 series stainless steel.